

## Claims

- [c1] 1. A method of forming a fuse structure, comprising:  
providing a substrate which comprises a C4 metallurgy contact pad and a fuse therein;  
forming an etch resistant layer over said C4 metallurgy contact pad and said fuse;  
forming at least one passivating layer over said etch resistant layer;  
removing at least a first portion of said at least one passivating layer and said etch resistant layer to expose said C4 metallurgy contact pad;  
forming a C4 metallurgy structure over said C4 metallurgy contact pad; and  
thereafter removing at least a second portion of said at least one passivating layer to expose said etch resistant layer over said fuse.
- [c2] 2. The method of claim 1, wherein said substrate comprises a plurality of metal wiring layers and a plurality of dielectric layers; and said C4 metallurgy contact pad and said fuse are formed within the final metal wiring layer.
- [c3] 3. The method of claim 2, wherein said step of forming a C4 metallurgy structure includes depositing a BLM over said at least one passivating layer and said exposed C4 metallurgy contact pad; etching said BLM; and forming a C4 solder bump on the remaining BLM.
- [c4] 4. The method of claim 3, wherein said step of etching said BLM is carried out at the same time as said step of removing at least a second portion of said at least one passivating layer.
- [c5] 5. The method of claim 2, wherein said plurality of dielectric layers comprise a low-k organic material, a fluorosilicate glass or silicon oxide.
- [c6] 6. The method of claim 5, wherein said substrate comprises at least five metal wiring layers; and each of said dielectric layers comprises a low-k organic material, a fluorosilicate glass or silicon oxide.
- [c7] 7. The method of claim 2, wherein said etch resistant layer provides a substantially uniform passivation thickness over said fuse.

- [c8] 8. The method of claim 7, wherein said substantially uniform passivation thickness is sufficiently thin to ensure low energy fuse deletion and sufficiently thick to ensure substantially no contamination of said fuse before deletion due to exposure to the ambient.
- [c9] 9. The method of claim 8, wherein said etch resistant layer comprises silicon nitride.
- [c10] 10. The method of claim 9, wherein said etch resistant layer has a thickness of about 75 to about 150 nm.